

ABSTRACT OF THE DISCLOSURE

A high-performance projection exposure apparatus and method which can adjust optical characteristics which are rotationally asymmetric with respect to the optical axis of projection optical system and which remain in the projection optical system. In exemplary embodiments, the projection exposure apparatus includes an illumination optical system, a projection optical system and a plurality of optical elements. The illumination optical system illuminates a first object, and the projection optical system projects an image of the first object onto a second object under a predetermined magnification. The optical elements are set between the first object and the second object, and has rotationally asymmetric powers with respect to an optical axis of the projection optical system. Consequently, the optical elements can correct an optical characteristic rotationally asymmetric with respect to the optical axis of the projection optical system remaining in the projection optical system.